

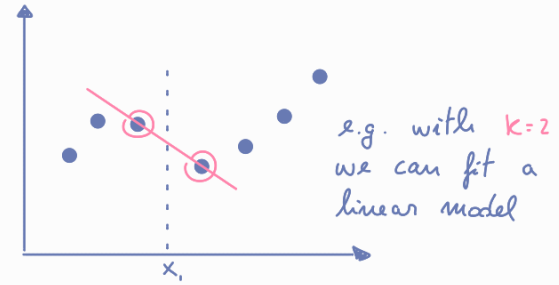
Locally Weighted Regression

This is the same concept of KNN but for regression problems.

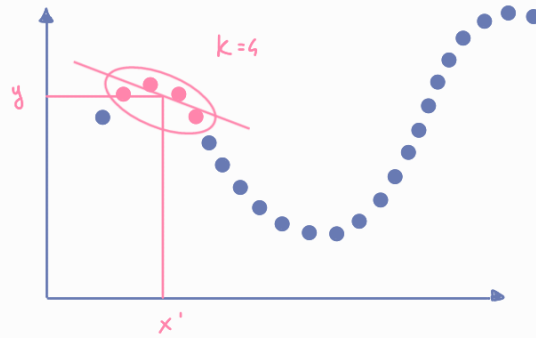
Let's assume we have a regression problem $f: X \rightarrow \mathbb{R}$ with dataset $D = \{(x_n, t_n)\}_{n=1}^N$. We want to fit a local regression model around the query sample x_q .

- ① Compute $N_k(x_q, D)$: k -nearest neighbors of x_q
- ② Fit a regression model $y(x; w)$ on $N_k(x_q, D)$
- ③ Return $y(x_q; w)$

The concept of local regression implies that the value for x' does not depend on points that are far away.



When $k=2$ and we use a linear model it is called *interpolation* →



Pros { ① No training phase

Cons { ① Requires storing all the dataset
② Depends on the distance function (in many cases it is not easy to define a distance function)

When experimenting with a complex method, you should compare it with KNN (baseline) because of its simplicity